

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Shozaburo Konishi, et al.

Serial No. 10/566,915

Examiner: Vishal Vasisth

Filed: August 6, 2004

Group Art Unit: 1797

For: SYSTEM HAVING DLC CONTACT SURFACES METHOD OF
LUBRICATING THE SYSTEM, AND LUBRICANT FOR THE
SYSTEM

RULE 132 DECLARATION

I, Shigeki TAKESHIMA, a Japanese citizen having an address at 11-21, Midorigahama, Chigasaki-shi, Kanagawa 253-0034 Japan, declares as follows:

1. I am a researcher and worked with the inventors of the above-identified application from April 2002 to March 2005.
2. In March 1982, I graduated from Tokyo Institute of Technology, Graduate School of Engineering, where I was enrolled at Department of Chemical Engineering. In April 1982, I was employed by Mitsubishi Oil Company, where I was enrolled at Research Laboratory, R&D of Carbon Fiber. In April 1990, I was attached to R&D of Lubricants of the same company, where my main work was about research and development of marine lubricants. From April 2002 to March 2008, my main work at the same section was about research and development of passenger car engine oils and heavy duty diesel engine oils. Since April 2008, I have been involved in researches and development of marine lubricants at the same section. I have been working for the company since 1982, while the name of the company has changed to Nippon Mitsubishi Oil Corporation in April 1999, Nippon Oil Corporation in June 2002, and then to JX Nippon Oil & Energy Corporation in April 2010.
3. I am a coauthor of "Ultralow friction of DLC in presence of glycerol mono-oleate (GMO)", Tribology Letters, 18, 2 (2005) 245; "Development of High Performance Heavy-Duty Diesel Engine Oil to Extend Oil Drain Intervals: 5W30 Fully Synthetic Oil Containing MoDTC", SAE Paper, SAE2000-01-1992; "Development of Low-Ash Type Heavy Duty Diesel

“Engine Oil for After-Treatment Devices”, SAE Paper, SAE2004-01-1955; “A Study of Engine Oil Composition Effects on Zeolite-type SCR Catalyst Durability”, SAE Paper, SAE2007-01-1924; and “Volatility of Exhaust Catalyst Poisons in Engine Oils”, Review of Automotive Engineering, Vol. 28, No. 2, p225 (2007).

4. I am familiar with the specification and the claims of this application.
5. I have conducted the following experiment under my direct supervision.

Experiment

Lubricant was prepared as shown in Table below. The obtained lubricant was subjected to SRV friction test in the same way as described in Example 1-1 of the present application, using the test piece and the system similar to those in Example 1-1 shown in Table 1 and Fig. 1 of the present application. The results are shown in Table below, together with the results of Examples 5-1 to 5-5 of the present application for the sake of comparison.

In the Table, base oil I and the various additives are the same as those in Table 6 of the present application unless otherwise noted.

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Table

	Experiment	Ex. 5-1	Ex. 5-2	Ex. 5-3	Ex. 5-4	Ex. 5-5
Base oil (mass% based on total amount of base oil) Base oil I (Lubricant base oil (A))	100	100	100	100	100	100
Additive (mass% based on total amount of composition)						
(B) Sulfur-free metal detergent I	3.0	3.0	3.0	3.0	-	3.0
(C) Sulfur-free phosphorus compound	1.0	1.0	-	-	1.0	1.0
(D) Sulfur-free anti-oxidant I	1.0	-	1.0	-	1.0	1.0
(D) Sulfur-free anti-oxidant II	-	-	-	1.0	-	-
Friction Modifier I	1.0 ¹⁾	1.0 ²⁾				
Results of Performance Test						
SRV friction test: after 10 minutes	0.053	0.040	0.039	0.036	0.039	0.039
: after 30 minutes	0.053	0.042	0.039	0.036	0.038	0.039

Note: 1) sorbitan monooleate

2) glycerin monooleate

6. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United State Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Declared and signed at Yokohama, Japan
Dated this day of 8. Nov. , 2010

Shigeki Takeshima
Shigeki TAKESHIMA